

REMARKS

This amendment, submitted in response to the Office Action dated September 12, 2003, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested. The claims have been amended for improved conformity to US practice and improved clarity. The claim amendments are not being made to overcome the prior art rejections, and are not necessary to overcome the prior art rejections, as will become apparent from the discussion below.

Claims 1-13 are now pending in the present application. Claims 1 and 11 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Cao (USP 6,337,755). Claims 2 and 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cao in view of Ransijn (USP 6,347,128). Claims 3 and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cao in view of Ransijn and further in view of Bigo (USP 6,323,979). Claims 5 and 6 have been deemed to contain allowable subject matter and would be allowed if rewritten in independent form. Applicant submits the following in traversal of the rejections.

Drawings

The Examiner has objected to the drawings maintaining that the features of claim 7 are not disclosed in the drawings. Figs. 2 and 3 have been amended to indicate that the reference-voltage is remote controlled. It is believed that the amendments to the figures comply with 37 C.F.R. § 1.83(a). Therefore, Applicant respectfully requests that the Examiner withdraw the objection to the drawings.

Claim Rejections - 35 U.S.C. § 112

Claim 7 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The Examiner states there is no support for remote control in that the specification does not describe how remote control is achieved.

The subject-matter of claim 7 is described on for example, page 10, lines 9-11. It is specified in this part of the description that the reference voltage can be controlled by supervision. Supervision is well known to one of ordinary skill in the art. Supervision consists of sending a so-called supervisory signal from one terminal equipment of the transmission system (the supervisory signal can be sent on a dedicated channel or by adding it as a low modulation signal on one of the data signal or on the WDM signal) to monitor and control one or more of the parameters of the regenerator (monitoring the voltage power at the output of the VCO, the diodes, the amplifiers; controlling the VCO and the reference voltage V_{ref}).

Furthermore, Applicant submits that there was no rejection of claim 7 on the merits. Therefore, any subsequent Office Action should be made on a non-final basis.

Rejection of claims 1 and 11 under § 102(e) as being anticipated by Cao

The Examiner maintains Cao teaches *a modulation clock* from a *clock distribution unit* in which the clock distribution unit comprises a *reference clock* and for each modulator, means for synchronizing the phase of a *copy* of the reference clock with the signals applied to the modulator, citing col. 4, lines 26-35, col. 6, lines 58 to col. 7, line 3 in support.

The present invention proposes to use a single one reference clock (22 and 34) whereas Cao shows a regenerator in which each channel has its own reference clock (24 and 28).

Therefore, Cao demonstrates a solution similar to the prior art (see page 1, lines 21-31 of the specification) which is bulky, costly and has a high power consumption because of the number of electronic circuits to be replicated for clock recovery.

Furthermore, the respective aspects of Cao cited by the Examiner describe the clock recovery circuit 24. The clock recovery circuit 24 generates an electrical clock signal. The clock recovery circuit 24 also functions to adjust the phase of the clock signal so that the clock signal received at the modulator 20 is in phase with the optical channel signal received by the modulator 20 from the optical filter.

It does not appear that all of the aspects of the clock distribution unit of claim 1 are described in Cao. In particular, only a clock recovery circuit is described in Cao. It appears that the Examiner is referring to the clock recovery circuit 24 for teaching a reference clock. However, it does not appear that clock recovery circuit 24 teaches the clock distribution unit and modulation clock of claim 1. Since the burden is upon the Examiner to establish that all of the elements of claim 1 are taught in Cao, Applicant respectfully requests that the Examiner more particularly demonstrate where the clock distribution unit, modulation clock and reference clock of claim 1 are taught in Cao.

Assuming the Examiner is citing clock recovery circuit 24 for teaching the reference clock of claim 1, it is apparent upon viewing Fig. 1, that each optical path 14a-14d comprises a clock recovery circuit and not a *copy* of a reference clock.

For the above reasons, claim 1 should be deemed patentable. Dependent claims 2-11 should be deemed patentable by virtue of their dependency to claim 1.

Rejection of claims 2 and 8-10 under § 103 over Cao and Ransijn

Claim 2

Ransijn is cited for teaching a phase-locked loop for each modulator. As previously indicated, Cao does not teach a phase synchronization means, and Ransijn does not cure the deficiency of Cao. Therefore, the combination of Cao and Ransijn do not teach the elements of claim 2.

Furthermore, there would be no reason to combine the phase-locked loop of Ransijn with Cao because there is only a one time phase adjustment in Cao. Col. 4, lines 20-25. Therefore, there is no need to have a phase locked loop.

Moreover, modifying Cao to include a phase locked loop would require a substantial reconstruction of the circuit of Cao, evidencing that the Examiner's reasoning is merely a result of impermissible hindsight. MPEP 2143.01. Therefore, Applicant respectfully requests that the Examiner withdraw the rejection of claim 2.

Claims 8-10

Claim 8 describes that the reference clock is supplied by a voltage-controlled oscillator. The Examiner maintains it would have been obvious to combine the voltage-controlled oscillator (VCO) of Ransijn (element 26) with Cao.

In Cao, the clock recovery circuit 24 (reference clock as cited by the Examiner) receives a signal from a photodetector and generates an electrical clock signal having a frequency corresponding to the bit rate frequency of the optical channel signal directed by the WDD 1 onto

path 14a. Col. 4, lines 12-16. There would be no need for a VCO in Cao since, as indicated above, there is only one phase adjustment.

Furthermore, combining the VCO of Ransijn with Cao would require a substantial reconstruction of the circuit of Cao, evidencing that the Examiner's reasoning is merely a result of hindsight. Therefore, claim 8 and dependent claims 9 and 10 should be deemed patentable.

Claim 10 requires that a clock recovery circuit supplies a control signal for the oscillator. The Examiner concedes Cao does not teach these elements and cites Ransijn to cure the deficiency. The Examiner cites PD(t) of Ransijn for teaching a control signal for the oscillator. PD(t) of Ransijn teaches a phase detector output. A phase detector output is not a control signal as described in the present invention.

Moreover, claim 10 describes a clock recovery circuit. The Examiner cites element 24 of Cao for teaching a clock recovery circuit. However, element 24 was previously cited for teaching a reference clock which is different from the clock recovery circuit. Applicant requests that the Examiner demonstrate where the prior art disclose a reference clock and a clock recovery circuit. Since the Examiner has failed to establish that a reference clock and a clock recovery circuit are taught in the prior art, claim 10 should further be deemed patentable.

***Rejection of claims 3 and 4 under § 103(a) as being unpatentable
over Cao in view of Ransijn and Bigo***

Claim 3

The Examiner concedes Cao does not disclose a phase-locked loop including a phase-shifter (claim 3) and cites Ransijn to cure the deficiency. Assuming Ransijn taught the phase

shifter of claim 3, the Examiner has not provided any explanation as to why it would be obvious to combine the phase-shifter of Ransijn with Cao. As previously indicated, there does not appear to be any reason to combine the phase-locked loop of Ransijn with Cao since Cao only has a one time phase adjustment.

The Examiner maintains Ransijn discloses the modulation clock of claim 3. However, a modulation clock was initially cited in claim 1, for which the Examiner cited Cao in support. Therefore, Applicant requests clarification as to whether Cao or Ransijn is being cited for teaching a modulation clock.

The Examiner concedes a combination of Cao and Ransijn does not disclose a phase shifter controlled in accordance with the average power of the output signal of the modulator and cites Bigo (element 10, col. 4, lines 23-33) to cure the deficiency.

The respective column and lines of Bigo cited by the Examiner describe that a signal is used to control a phase adjustment means. The signal output from a fiber 1 after traveling through a coupler 2 is of an intensity that is representative of the phase profile integrated over the modulation length. This signal increases with increasing closeness of phase between the signal to be regenerated and the clock. It does not appear that Bigo discloses supplying a voltage representative of the *average power of the output signals* of the modulator. Therefore, the combination of Cao, Ransijn and Bigo do not teach the elements of claim 3 and claim 3 should be deemed patentable. Applicant respectfully requests that the Examiner withdraw the rejection of claim 3.

Claim 4

Claim 4 requires the phase-locked loop includes a coupler adapted to sample a portion of the output signals of the modulator. The Examiner maintains Cao element 16 teaches a coupler. Element 16 of Cao is an optical tap. An optical tap 16 has first and second optical outputs that are coupled to first and second optical fibers 17. See col. 3, lines 20-23. It is apparent that an optical tap is not a coupler. Assuming an optical tap is a coupler, the optical tap 16 couples the outputs of the first and second optical outputs and does not *sample* a portion of the input signals. Therefore, claim 4 should be deemed patentable.

Applicant has added claims 12 and 13 to provide a more varied scope of protection. Claim 12 further describes the receipt of signals by the optical modulators and claim 13 further describes the phase-locked loop. Claim 12 and 13 should be deemed patentable by virtue of their dependency to claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
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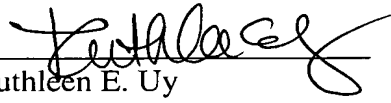
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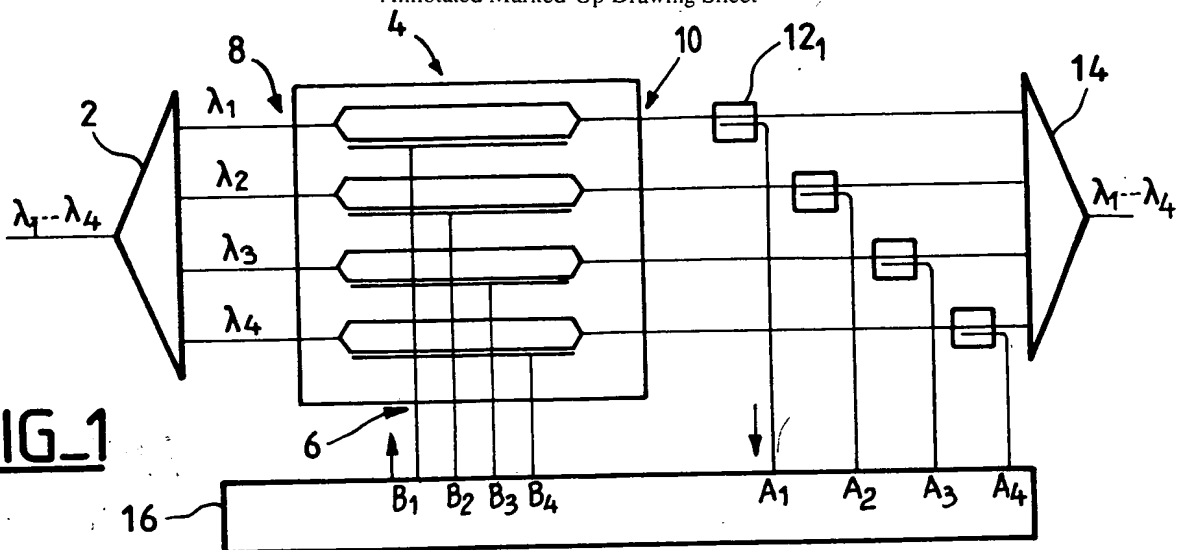


FIG. 1

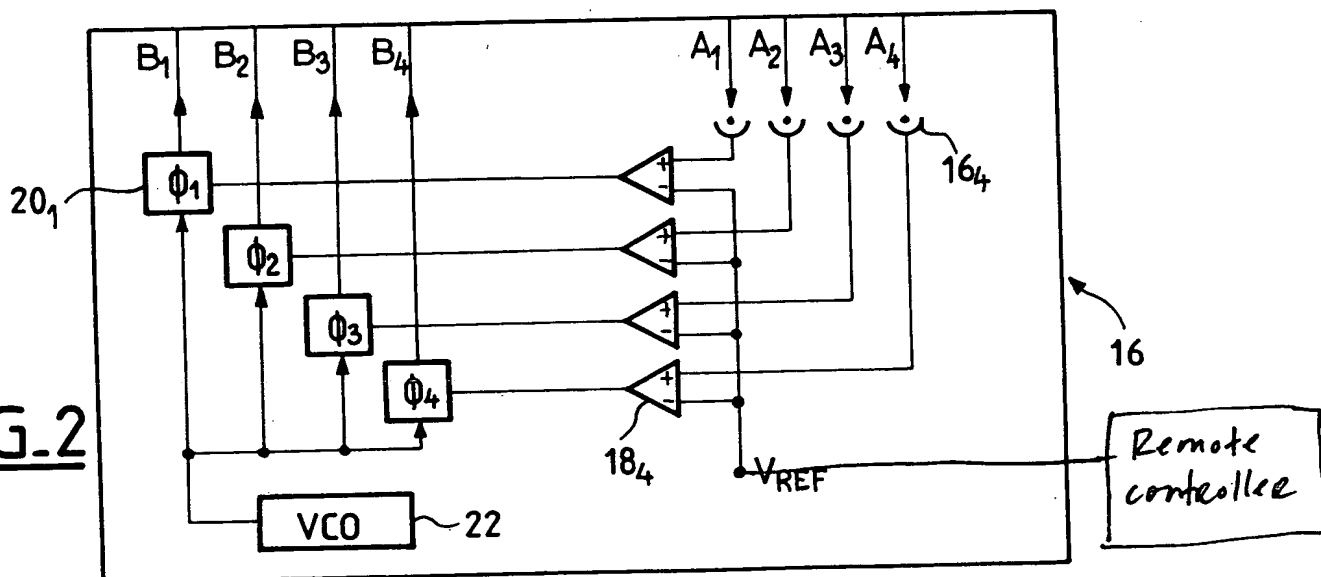


FIG. 2

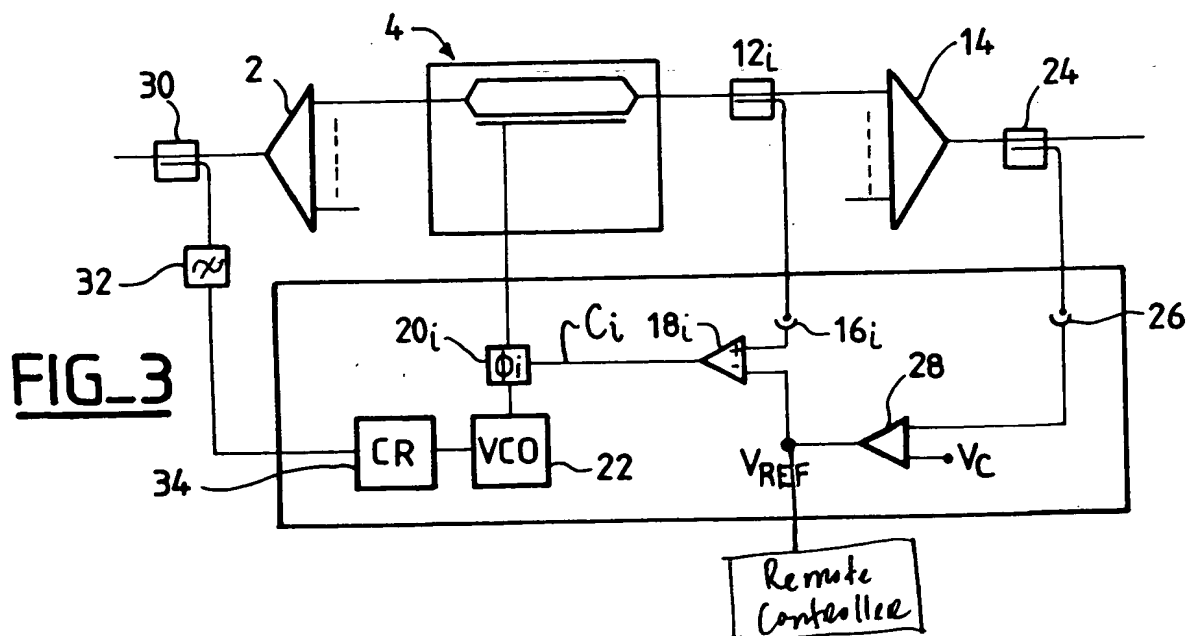


FIG. 3